DOCUMENT RESUME

ED 403 494 CE 073 513

TITLE	Training Practices.
PUB DATE	96
NOTE	31p.; In: Academy of Human Resource Development (AHRD) Conference Proceedings (Minneapolis, MN, February 29-March 3, 1996); see CE 073 480.
PUB TYPE	Speeches/Conference Papers (150) -- Reports - Research/Technical (143) -- Viewpoints (Opinion/Position Papers, Essays, etc.) (120)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Adult Education; Data Collection; Educational Games; Educational Quality; Educational Research; *Industrial Training; Instructional Development; Job Analysis; *Labor Force Development; Literature Reviews; *Management Development; Models; *Needs Assessment; Performance Based Assessment; Performance Technology; Personnel Evaluation; Simulation; State Agencies; Strategic Planning; Systems Approach; Task Analysis; *Training Methods; *Transfer of Training
IDENTIFIERS	Connecticut

ABSTRACT

This document contains four papers presented at a symposium moderated by Valeria Stokes at the 1996 conference of the Academy of Human Resource Development. "Management Development Simulations: Effective or Not?" (Jill R. Hough) reviews the differences between simulations and educational games and presents a simulation classification scheme that is used to organize research related to the effectiveness of management education and management training simulations. "Job Analysis Validity & Workability" (Reva Hutchins, James E. Sage) presents findings relating to key job analysis purposes/concerns that were identified through an evaluation of 6 selected job analysis methods by 64 respondents. William J. Rothwell's paper, "A Survey about Training Needs Assessment Practices in Selected Organizations: Summary of Results" summarizes the results of a 1995 survey of American Society for Training and Development members that examined the effectiveness of training needs assessment methods. "Strategic Quality Training: A Comprehensive Training Process to Ensure Transfer of Learning" (Sandra L. Hastings et al.) describes how the Connecticut Department of Labor used the Strategic Quality Training model to achieve a minimum of 81% long-term transfer of training for a technical skills program. Papers contain references. (MN)

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SYMPOSIUM
[32] TRAINING PRACTICES

Chair: Valeria Stokes, Sears Company

Management Development Simulations: Effective or Not?
Jill R. Hough, Alternative Environments

Job Analysis Validity & Workability
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A Survey about Training Needs Assessment Practices in Selected Organizations: Summary of Results
William J. Rothwell, Pennsylvania State University

Strategic Quality Training: A Comprehensive Training Process to Ensure Transfer of Learning
Sandra L. Hastings, Barbara Palmer, Rosellen East, Janice Schuyler, Deanna Green, John Dyer, and Carol Bilotti, Connecticut Department of Labor

Academy of Human Resource Development
1996 Conference
Minneapolis, MN
February 29-March 3, 1996

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Management Development Simulations: Effective or Not?

Jill R. Hough
Alternative Environments

Simulations and games have become popular instructional methodologies. This paper reviews the differences between these methodologies and presents a classification scheme consisting of total enterprise simulations, functional enterprise simulations, microworlds, and behavioral simulations. The classification scheme is then used to organize the research related to the effectiveness of management education and management training simulations.

In the forty years since the first business game was created (Lane, 1995), simulations and games have become widely used as instructional strategies. In the first major attempt to determine the use of business games, Faria (1987) surveyed corporate training and development managers and found that over 55% of the respondents used some form of simulation game or exercise in management training. Several years later, similar results were obtained by Wagner who found that 58% of the training directors that responded to his survey used some type of indoor game or simulation (cited in Wiesendanger, 1993). More recently *Training* magazine's 1995 Industry Report indicated that 63% of the organizations surveyed used games and/or simulations as an instructional method.

Given the wide use of games and simulations, Kirk surveyed practitioners to learn "why" and "how" these strategies are implemented in training programs (cited in Morris, 1995). The survey results showed that 17% of training time was spent on games or simulations and identified a broad range of purposes for using games.

What is Simulation?

The term "simulation" does not have universal meaning. While some authors have made a distinction between terms such as "simulation," "game," "experiential exercise," "role play," "gaming simulation," "simulators," etc. (Keiser & Seeler, 1987; Klietsch, Wiegman, & Powell, 1969; Lane, 1995; McAteer, 1991; Thornton & Cleveland, 1990), others have used the terms "game" and "simulation" interchangeably (e.g., Faria, 1987; Hsu, 1989; Jacobs & Baum, 1987; Raia, 1966; Wolfe, 1976b).

Games have been defined as follows:

- "A game is a structured activity in which two or more participants compete within constraints of rules to achieve an objective" (Keiser & Seeler, 1987, p. 460).
- "Learning games are multi-person, competitive, interactive, learning units" (Klietsch et al., 1969, p. 4).
- "A 'game' is then defined as a specified sequence of activities designed to convey benefits to the players" (Lane, 1995, p. 606).
- "A physical or mental competition conducted according to rules with the participants in direct opposition to each other" (Webster's New Collegiate Dictionary, 1979, p. 467).

Each of these definitions either explicitly, or implicitly, suggests that games have: (a) structure or rules, (b) active participation, and (c) goals or objectives. In addition, all but Lane's definition includes some form of competition.

Definitions of the term "simulation" found in the literature include:

- "A simulation is an operational model, using selected components, of a real or hypothetical process, mechanism, or system" (Keiser & Seeler, 1987, p. 460).
- "A simulated experiential environment is a simplified and contrived situation that contains enough verisimilitude, or illusion of reality, to induce real world-like responses by those participating in the exercise" (Keys & Wolfe, 1990, p. 308).

Author's Note: The author gratefully acknowledges the encouragement and review provided by Dr. Catherine Sleezer.

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- "A 'simulation' is a specified sequence of verisimilitudinous activities designed to convey lessons to the participants on the properties of a real-world situation" (Lane, 1995, p. 606).
- "The imitative representation of the functioning of one system or process by means of the functioning of another" (Webster's New Collegiate Dictionary, 1979, p. 1074).

By defining simulation as a "model" or "representation of a system," these definitions, like the definitions of games, imply structure and goals. And when used in a training context, participation is also implied. However, simulations are inherently more verisimilitudinous, or realistic, than games. Lane (1995) provided a practical example: In the Island Escape game, players must imagine that they are shipwrecked together on a volcanic island. With limited time and resources for evacuation, they must quickly decide which surrounding island offers the best opportunity for long-term survival. Although Lane conceded that general lessons can be learned from this game, he maintained that it did not have the verisimilitude of a simulation.

Based on these definitions, many "business games" referred to in the literature are actually business simulations (Lane, 1995). However, the training and development literature does contain a mixture of games and simulations (e.g., "Industry Report", 1995; Jacobs & Baum, 1987; Morris, 1995). Therefore, when reviewing research it is imperative that the terminology used be critically evaluated. In this paper, simulation is defined as an activity that (a) is based on a verisimilitudinous model or system representation and (b) includes participant interaction with the model and/or other participants. The term game will be used only when required by a direct quote.

Classifying Management Simulations

Simulations take many different forms as do their classification schemes. Keys and Wolfe (1990) identified five types of simulated experiences: (a) experiential exercises, (b) total enterprise, (c) in-basket simulation, (d) complex behavioral simulations, and (e) functional business games. McAteer (1991) described simulations as either open or closed with "structure" and "format" used as more detailed descriptors. Although Lane (1995) did not "label" the types of simulations, his article included an appendix which described five "very different types of management simulations" (p. 604). Klietsch's et al. (1969) classification scheme focused on whether the simulation was manual, mixed, or computer based. Biggs (1987) used only two classifications for simulations: general management and functional. Amount of complexity was used by Thornton & Cleveland (1990) in classifying simulations into the broad categories of (a) one-on-one interview simulations, (b) leaderless group discussion, (c) in-basket techniques, (d) complex decision-making simulations, and (e) large-scale behavioral simulations.

Common among these classification schemes is the absence of: (a) "microworlds" (sometimes referred to as "management flight simulators") advocated by MIT researchers (e.g., Bakken, Gould, & Kim, 1992; Graham, Morecroft, Senge, & Sterman, 1992) and (b) an illustration of the relationship between the different types of simulation.

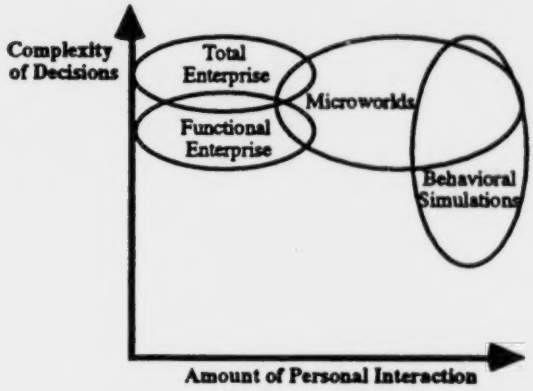
Synthesizing the definition of simulation, the classifications previously cited and the missing elements, results in a classification scheme for categorizing simulations into one of four basic types: (a) total enterprise, (b) functional enterprise, (c) microworlds, and (d) behavioral simulations. Definitions adopted from the literature for each type are as follows:

> A total enterprise game is one which includes decisions in most of the main functions of business: marketing, production, finance, and personnel. Such games require integration of the various functional areas. In addition, total enterprise games incorporate environmental factors, such as general economic conditions and interest rates as important components of the learning experience. . . .
>
> A functional [enterprise] business game is one which focuses on one of the major business functions of marketing, production and operations, personnel and human resources, or accounting and finance. While decisions in each of the areas may be required, the focus is on only one area and there are many decisions which must be integrated within the functional area (Keys & Biggs, 1990, p. 49, 58).

Microworlds are "microcosms of real business settings where teams of managers together learn by conducting experiments that are difficult or impossible to conduct in real business" (Senge, 1990, p. 299). Behavioral simulations "attempt to reproduce individual and collective behaviors that would normally be observed in a real-world environment" (Dutton & Stumpf, 1991, p. 151).

Figure 1 illustrates the relationship between the four types using complexity and interaction as descriptors. Increased complexity is characterized by an increasing number of decisions and/or greater breadth of decisions. Increased personal interaction is characterized by an increasing emphasis on the "process" of decision-making or managing, i.e. how participants interact with one another and/or the model.

Figure 1. Types of Management Simulation as a Function of Complexity and Personal Interaction



The figure illustrates several observations gleaned from the definitions and simulation literature. First, as models of reality, complexity is inherent in simulations. Second, functional enterprise simulations are generally less complex than total enterprise simulations. However, it is possible that a simplistic total enterprise simulation could be less complex than a detailed functional enterprise simulation. Third, although total and functional enterprise simulations may require participants to interact with team mates in making business decisions, the models do not emphasize personal relationships and developing such relationships are not part of the learning objectives. Fourth, behavioral simulations by definition have a high level of personal interaction but may vary in complexity. Finally, microworlds are generally based on representations of actual complex systems and emphasize mapping, challenging, and improving the underlying mental models. As such, they require both high levels of complexity and high levels of personal interaction.

Research on the Effectiveness of Simulations in Management Development

Despite what Lane (1995) called a "resurgence" of interest in management simulations, he concluded that there is "too much belief and too little evidence" (p. 617) related to knowledge acquisition and transference to the workplace. Although Keys and Wolfe (1990) acknowledged the need for research continuity as well as "fresh new approaches," they concluded that "management games have been found to be generally effective and to possess internal validity in the strategic management type course" (p. 316). These comments highlight the lack of agreement on simulation effectiveness.

Furthermore, the conclusion drawn by Keys and Wolfe (1990) identified one pitfall of simulation research as it relates to Human Resource Development–much of the research on simulation effectiveness has been conducted in the educational context of college classrooms. Hall (1995) identified several differences between the academic setting and the setting of an executive short course including: logistics, complexity, duration, knowledge, experience, maturity, objectives, and power. Based on these differences, he argued that simulations designed for the academic setting are inappropriate for executive training.

Yet, this does not mean that simulation research conducted in the academic setting is not applicable to management development. Actually, college-level research is part of the "management education" element of Wexley & Baldwin's (1986) three-part management

development framework that includes: (a) management education, (b) management training, and (c) on-the-job experiences.

Wolfe and Roberts (1986) noted that both short- and long-term performance evaluations are important to educators. Short-term evaluations typically focus on learning and may question (a) whether learning has occurred or (b) how learning from one strategy compares to learning using another strategy. On the other hand, on-the-job performance is the focus of long-term evaluations.

To summarize: (a) simulations can take on different forms, (b) management development consists of management education and management training, and (c) it is important to consider both the short-term and long-term effectiveness of simulations. Thus, the next section of this paper summarizes the research as it relates to management education and management training according to the classification scheme presented earlier.

Management Education. "There are lamentably few rigorously controlled evaluations of their [simulations'] teaching ability. Many purported evaluations consist of faculty or student post hoc reactions" (Wolfe & Guth, 1975, p. 350). However, rigorous research on the use of simulations for management education can be found in the literature.

In a three-way comparison, Raia (1966) conducted a study comparing case studies, simple simulations, and complex simulations. He concluded that simulations enhanced knowledge, interest, and motivation when compared to case studies. He also concluded that simulation complexity did not significantly affect learning. In another study, Wolfe and Guth (1975) found simulations and cases were equal in teaching factual knowledge, but simulations were superior at teaching conceptual knowledge. In a similar study Keys and Wolfe (1990) summarized the research on comparative learning in a table that showed eight studies with positive findings and two studies with negative findings. Their discussion of the studies with negative findings indicated that these studies may have inherently favored the case method.

Other studies have focused strictly on the learning contribution from a simulation. For example, Whiteley and Faria (1989) used a functional enterprise simulation to conclude that quantitative skills, but not applied and theoretical skills, are enhanced by participation in a simulation. Washbush & Gosenpud (1993, 1994) concluded that although simulation performance did not predict learning, participants learned what was intended.

But how do simulations facilitate learning? Research supports three distinct theories. Wolfe (1976b) cited three studies that document interpersonal experiences as the prime source of learning. One of the studies cited was Dill and Doppelt who reported "students remember what they learn from interactions with other people more vividly than they remember what they learn from working on the analytic tasks in the game" (p. 53). The same study, along with another by Strother et al. (cited in Wolfe, 1976b), also concluded that simulations "fostered an awareness of problems but not the technical solution of them" (p. 52). On the other hand, Lane (1995) noted that some researchers view simulation building as more effective than actually participating in the activity.

In examining the question of whether participation in a simulation affects future performance, Wolfe and Roberts (1986) cited six studies which compared student simulation participants to successful businesspersons. When considered alongside studies that correlated a manager's simulation performance with his/her real-world business performance, the authors concluded that long-term effectiveness was supported in a comparative sense (Wolfe & Roberts, 1986). However, longitudinal studies comparing simulation performance to long-term career performance have shown inconsistent results. A study by Norris and Snyder (cited by Wolfe & Roberts, 1986) showed no correlation between simulation performance and career success after five years as measured by promotions, proximity to the highest position within the organization, and percentage of salary increase. Wolfe and Roberts criticized the methodology on three levels. First, subsequent studies showed that the simulation used by Norris and Snyder was ineffective at producing learning results. Second, career performance was measured on an individual basis while simulation performance was measured on a team basis. Finally, the choice of indices for both simulation performance and career success was questioned. A five-year longitudinal study was conducted by Wolfe and Roberts (1986) using 142 undergraduate business seniors. By the authors' own admission "the study's results can provide grist for those who wish to either believe or disbelieve business gaming's external validity" (p. 54). But a follow-up study by Wolfe and Roberts (1993), showed that an individual's peer-assessed contribution was correlated to income level, salary increases, and number of promotions five years after graduation.

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Many other rigorous studies on simulation effectiveness have been reported in the literature. In 1973 Greenlaw and Wyman reviewed 22 studies. In 1985 Wolfe published a ten-year update that reviewed 39 additional studies. Table 1 summarizes the results from these two reviews. In addition, several studies published since the Wolfe article are included. Hsu's (1989) summary table of the Greenlaw and Wyman and Wolfe reviews was used to assist in developing the table.

Table 1. Summary of Research Results on the use of Simulations in Management Education

	Short-term Effectiveness		Long-term Effectiveness	
	Positive	Inconclusive or Negative	Positive	Inconclusive or Negative
Total Enterprise Simulations	9 studies cited by Greenlaw & Wyman, 1973 14 studies cited by Wolfe, 1985 Wheatley, Hornaday, & Hunt, 1988 (cited in Keys & Wolfe, 1990) Washbush & Gosenpud, 1993, 1994	9 studies cited by Greenlaw & Wyman, 1973 8 studies cited by Wolfe, 1985	1 study cited by Wolfe, 1985 Wolfe & Roberts, 1993	3 studies cited by Wolfe, 1985 Wolfe & Roberts, 1986
Functional Enterprise Simulations	2 studies cited by Greenlaw & Wyman, 1973 5 studies cited by Wolfe, 1985 Whiteley & Faria, 1989	6 studies cited by Greenlaw & Wyman, 1973 11 studies cited by Wolfe, 1985 Whiteley & Faria, 1989		
Behavioral Simulations				
Microworld Simulations	Bakken, Gould, & Kim, 1992			
Simulation Type Unspecified	Gosenpud & Washbush, 1993		7 studies cited by Wolfe & Roberts, 1986	

From the table one can see that most of the research, as it relates to management education, has been conducted using total or functional enterprise simulations. This finding could reflect the greater emphasis on factual and conceptual management learning in the education environment and less emphasis on personal interactions or the "process" of decision-making. An enterprise simulation "concentrates and emphasizes the policy-making activities, while it simultaneously distills out much of the politics, physical and mental exhaustion, and trivia of organizational life" (Wolfe, 1976a).

Management Training. In comparison to management education, relatively little rigorous research has been conducted on the effectiveness of simulations for management training. As noted by Thornton and Cleveland (1990) it has been through practical applications that many simulations have demonstrated their effectiveness.

As shown in Table 2, support for the short-term effectiveness of simulations has been demonstrated by at least five separate studies. Although not specifically designed to study learning

in management training, a comparative study conducted by Wolfe (1976a) showed that both college students and practicing managers experienced significant increases in administrative skill and environmental cognizance. In a true management training environment with public utility executives, data gathered by Over (1993) indicated that (a) participants valued the experience and (b) learning did occur.

Table 2. Summary of Research Results on the use of Simulations in Management Training

	Short-term Effectiveness		Long-term Effectiveness	
	Positive	Inconclusive or Negative	Positive	Inconclusive or Negative
Total Enterprise Simulations	Wolfe, 1976 Over, 1993			
Functional Enterprise Simulations				
Behavioral Simulations	Van Velsor, Ruderman & Phillips, 1989			
Microworld Simulations	Bakken, Gould, & Kim, 1992 Drew & Davidson, 1993	Bakken, Gould, & Kim, 1992		

The first behavioral simulation with an organizational context and the ability to replicate management behavior was Looking Glass, Inc. (McCall & Lombardo, 1978). Although initially developed as a research instrument, Looking Glass designers soon recognized the simulation's potential as a training tool. However, limited research related to the effectiveness as a training strategy is found in the literature. In one study, Van Velsor, Ruderman, and Phillips (1989) content-analyzed the "lessons learned" by 72 participants and compared the results to Luthans' model of managerial activities. They found that each of Luthans' activities was represented in Looking Glass lessons.

In research on the use of microworld simulations, Drew and Davidson (1993) reported that participation in a telecommunications industry simulation increased participants understanding of the overall industry and the challenges facing the participant's organization, and provided an appreciation for functional and individual interfaces. Other studies reported by Bakken et al. (1992) focused on learning. In one instance, managers from a computer manufacturer participated in a seminar that included an introduction to systems thinking, participation in the People Express management flight simulator, and a session on advanced causal-loop diagramming. Based on responses to a learning instrument, researchers concluded that participants could respond appropriately to situations containing a structure similar to People Express; but, little learning transfer to dissimilar situations was observed. In another study, which included participation in two simulations with similar underlying structures, learning was confirmed based on improved performance from the first to the second simulation.

Graham et al. (1992) advocated the need for methods of measuring simulation effectiveness followed by sound research on the effectiveness of management flight simulators and microworlds. However, from Table 2 it is clear that research on the use of all types of simulations for the purpose of management training is still desperately needed.

Continuing Research

In "The Role of Management Games and Simulations in Education and Research" Keys and Wolfe (1990) encouraged additional research on the use of simulations in an educational context. They suggested this research can be categorized into three broad areas: inputs, process, and outputs.

Using their framework, opportunities for additional research within the broader context of management development will be presented.

"Input" research could include the study of constructing simulations and selecting teams. Questions involving construction include: What simulation characteristics must be present to ensure learning? How does simulation complexity affect learning? When developing microworlds, who should be involved (i.e., does learning improve when participants assist in model development)? Which types of simulations are best for different classifications of learning objectives? Are there learning differences between computer-based simulations and manual simulations? How much information should be provided to players? On the other hand, the amount of learning may be more a function of the students than of the simulations. Previous studies (cited in Keys & Wolfe, 1990) have shown little correlation between participant aptitude and simulation performance while showing more significant correlation between measures of achievement and performance. However, these studies were conducted in a higher education context. What are the correlations when participants are from business and industry? What is the most effective team size? How can team performance be correlated to individual performance?

Simulation administration is the principal concern in "process" research. "Comprehensiveness of the research in this area is rather spotty. This is unfortunate, because second to the quality of the simulation itself, the administration of a game is probably the most important factor associated with a game's success" (Keys & Wolfe, 1990, p. 314). Questions include: What effects do instructor reinforcements have on performance? What effect do rewards have? What is the optimum elapsed time for a simulation? How does team cohesion affect performance? What effects do "supplemental" materials have on learning? What effect does pre-instruction have on performance?

Most of the "output" research has revolved around simulation performance. However, for HRD the most important questions center on performance in the workplace. For example: Is there a relationship between simulation performance and learning? Is there a transfer from the simulation environment to the workplace? Does model building produce better results than participation only? Do different simulation types produce different results?

With such widespread use of games and simulations in training and development, it is important that these strategies be clearly defined and rigorously researched. While many studies have been conducted on the effectiveness of simulations in the management education context, studies showing long-term effectiveness are clearly needed for both management training and management education. Also more research on "how" simulations create learning is warranted. Until such research is conducted, the effectiveness of simulation as a management development strategy remains an unanswered question. Thus, practitioners should exercise caution in using simulations as an instructional strategy.

References

Bakken, B., Gould, J., & Kim, D. (1992). Experimentation in learning organizations: A management flight simulator approach. *European Journal of Operational Research, 59*, 167-182.

Biggs, W. D. (1987). Functional business games. *Simulation & Games, 18*, 242-267.

Drew, S. A. W., & Davidson, A. (1993). Simulation-based leadership development and team learning. *Journal of Management Development, 12* (8), 39-52.

Dutton, J. E., & Stumpf, S. A. (1991). Using behavioral simulations to study strategic processes. *Simulation & Gaming, 22*, 149-173.

Faria, A. J. (1987). A survey of the use of business games in academia and business. *Simulation & Games, 18*, 207-224.

Gosenpud, J., & Washbush, J. (1993). Comparing the simulation with the case approach: Again! But this time using criteria appropriate for the simulation. *Developments in Business Simulation & Experiential Exercises, 20*, 126.

Graham, A. K., Morecroft, J. D. W., Senge, P. M., & Sterman, J. D. (1992). Model-supported case studies for management education. *European Journal of Operational Research, 59*, 151-166.

Greenlaw, P. W., & Wyman, F. P. (1973). The teaching effectiveness of games in collegiate business courses. *Simulation & Games, 4*, 259-294.

Hall, J. J. S. B. (1995). Chalk & cheese: Executive short-course vs academic simulations. *Developments in Business Simulation & Experiential Exercises, 22,* 19-23.

Hsu, E. (1989). Role-event gaming simulation in management education: A conceptual framework and review. *Simulation & Games, 20,* 409-438.

Industry Report. (1995). *Training, 32* (10), 37-82.

Jacobs, R. L., & Baum, M. (1987). Simulation and games in training and development. *Simulation & Games, 18,* 385-394.

Keiser, T. C., & Seeler, J. H. (1987). Games and simulations. In R. L. Craig (Ed.), *Training and development handbook: A guide to human resource development* (3rd ed.) (pp. 456-469). New York: McGraw-Hill.

Keys, B., & Wolfe, J. (1990). The role of management games and simulations in education and research. *Journal of Management, 16,* 307-336.

Keys, J. B., & Biggs, W. D. (1990). A review of business games. In J. W. Gentry (Ed.), *Guide to business gaming and experiential learning* (pp. 48-73). East Brunswick, London: Nichols/GP Publishing.

Klietsch, R. G., Wiegman, F. B., & Powell, J. R., Jr., (1969). *Directory of educational simulations learning games and didactic units.* St. Paul, MN: Instructional Simulations.

Lane, D. C. (1995). On a resurgence of management simulations and games. *Journal of the Operational Research Society, 46,* 604-625.

McAteer, P. F. (1991). Simulations: Learning tools for the 1990s. *Training and Development, 45* (10), 19-22.

McCall, M. W., Jr. & Lombardo, M. M. (1978). *Looking glass, inc.: An organizational simulation* (Technical Report 12). Greensboro, NC: Center for Creative Leadership.

Morris, L. (1995). The power of games. *Training & Development, 49* (7), 58-59.

Over, D. V. (1993). Evaluation of a simulation game as an education tool for utility professionals. *Developments in Business Simulation & Experiential Exercises, 20,* 140.

Raia, A. P. (1966). A study of the educational value of management games. *Journal of Business, 39,* 339-352.

Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization.* New York: Doubleday/Currency.

Thornton, G. C., III, & Cleveland, J. N. (1990). Developing managerial talent through simulation. *American Psychologist, 45* (2), 190-199.

Van Velsor, E., Ruderman, M., & Phillips, A. D. (1989). The lessons of looking glass: Management simulations and the real world of action. *Leadership & Organization Development Journal, 10* (6), 27-31.

Washbush, J., & Gosenpud, J. (1993). The relationship between total enterprise simulation performance and learning. *Developments in Business Simulation & Experiential Exercises, 20,* 141.

Washbush, J., & Gosenpud, J. (1994). Simulation performance and learning revisited. *Developments in Business Simulation & Experiential Exercises, 21,* 83-86.

Webster's New Collegiate Dictionary. (1979). Springfield, MA: G. & C. Merriam.

Wexley, K. N., & Baldwin, T. T. (1986). Management development. *1986 Yearly Review of Management of the Journal of Management, 12* (2), 277-294.

Whiteley, T. R., & Faria, A. J. (1989). A study of the relationship between student final exam performance and simulation game participation. *Simulation & Games, 20,* 44-64.

Wiesendanger, B. (1993). Games managers play. *Sales & Marketing Management, 145* (2), 36-41.

Wolfe, J. (1976a). Correlates and measures of the external validity of computer-based business policy decision-making environments. *Simulation & Games, 7,* 411-438.

Wolfe, J. (1976b). The effects and effectiveness of simulations in business policy teaching applications. *Academy of Management Review, 1* (1), 47-56.

Wolfe, J. (1985). The teaching effectiveness of games in collegiate business courses: A 1973-1983 update. *Simulation & Games, 16,* 251-288.

Wolfe, J., & Guth, G. R. (1975). The case approach versus gaming in the teaching of business policy: An experimental evaluation. *Journal of Business, 48,* 349-364.

Wolfe, J., & Roberts, C. R. (1986). The external validity of a business management game: A five-year longitudinal study. *Simulation & Games, 17,* 45-59.

Wolfe, J., & Roberts, C. R. (1993). A further study of the external validity of business games: Five-year peer group indicators. *Simulation & Gaming, 24,* 21-33.

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Job Analysis Validity & Workability

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Job information is the basic data used by industry, governmental and private agencies, and employee organizations for many human resource programs (Hodgson, 1972). The nature of the required job information varies in type and approach according to program needs. Regardless of the ultimate use for which it is intended, however, the data must be complete, fair, representative, and valid (Sage & Rocco, 1993). Griggs v. Duke (1971) even established the legal need for using job analysis processes that involve employee and job applicant related decisions. The job analysis commonly serves as the basis for the instructional content of a training program. The analysis may also be used to tailor a job by adding certain duties and subtracting others from particular segments of a job description. Findings relating to key JA purposes and concerns for six selected JA methods are presented in this paper.

Background and Purpose

Occupational research, commonly referred to as Job Analysis (JA), includes assessment tools, associated activities, and work behaviors. Levine (1983) emphasized that the key link between workers and the organization was the job. Today, the job is still a viable link, however, as the job changes, so must the job description. The JA serves an important role in maintaining a valid job description that is truly representative of the job. As technology makes its debut in organizations, tasks performed in given jobs change. The introduction of new technology and processes, different market needs of our global society, and different employee knowledge, skills and abilities (KSAs) needed by employers drive the need for frequent job analyses.

For instance, tasks like preparing draft documents, using electronic spreadsheets, sending electronic messages and accessing electronic data bases frequently appear as part of the information age worker's jobs. Secretaries no longer simply take dictation and type a given number of documents each day between phone calls. Many secretaries, as an example, perform fewer word-processing tasks and more desktop publishing and graphics-based tasks. As a result, they interact with many more individuals and must become more aware of human relations, interpersonal skills, conflict management, teamwork, communications, and like concerns. The KSAs needed to perform these job tasks, at the desired level of proficiency, are quite different than the KSAs needed five years ago (Kirby, 1994). Just how different depends on what new technologies and tasks are being incorporated into the specific job.

To identify the impact of these technological changes contributing to job analysis validity and workability, an assessment of 'what the worker does' needs to be conducted. The results of this assessment determines if the worker's current job description, tasks performed, tools and equipment used and knowledge and skills required accurately reflect what the worker is doing. The purpose of this study was to examine internal characteristics of six JA methods/techniques that include Position Analysis Questionnaire, Critical Incident Technique, Comprehensive Occupational Data Analysis Program (TI/CODAP and stCODAP), Functional Job Analysis and DACUM. These methods/techniques are built on somewhat different theoretical foundations and therefore, the study of their effectiveness in relative terms is difficult. The Position Analysis Questionnaire (PAQ) is a worker-oriented job analysis system and characterizes the human behaviors, involved in jobs, that can be observed and described in quantitative terms used to rate job dimensions. The Critical Incident Technique (CIT) provides a

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worker-oriented approach to developing worker specifications from firsthand, behavioral data, job dimension by job dimension (Flanagan, 1954). Comprehensive Occupational Data Analysis Program (CODAP) consists of a series of interactive computer programs for analyzing, organizing, and reporting on data gathered from various inventories that focus on task performance (Ghorpade, 1988). TI/CODAP uses mark-sensed documents in conjunction with mainframe computer programs and atCODAP is accomplished using personal computers to generate interactive MS/DOS survey instruments. Functional Job Analysis is a job-oriented system based on a systematically articulated theory of jobs and people (Fine & Wiley, 1971); it uses people, data, and things and focuses on task performance needs. DACUM, an acronym for Developing A Curriculum, is an occupational analysis method performed by a panel of expert workers in the occupation.

Problem Statement and Theoretical Framework.

As the speed of technological change increases, the half-life of usable knowledge, skills and abilities (KSAs) decreases. However, many organizations are not updating this information to include the rapid changes in technology. The half-life of a job or an occupation introduces the serious problem of keeping job descriptions accurate and in compliance with Federal regulations. If job descriptions are kept accurate, Human Resource Management (HRM) /Human Resource Development (HRD) personnel need to conduct job analyses at the half-life points of the job or occupation. As more frequent job analyses are conducted, the cost of updating documents increases and the need for the traditional semi-annual or annual needs assessment diminishes. The JA tells the employer and his/her HRM/HRD personnel what KSA updates are needed.

The validity and reliability of many job descriptions and training programs are seriously degraded due to their lack of content validity and reliability. To minimize the degradation of a training/job description's validity and reliability, and the cost of replicating the job analysis process as a whole, a job analysis process must be used. The question faced by HRM/HRD personnel is "Which job analysis method(s) should I select?" The contribution this investigation makes to HRM/HRD is to provide findings that assist analysts in assuring validity, reliability, and flexibility while minimizing the cost of job analysis.

Research Questions

This descriptive research survey seeks to answer the following questions:

1. Which JA method studied is perceived to be the most effective for HRM/HRD personnel?
2. Which JA method studied is most versatile or adaptable to job changes?
3. Which JA method studied is perceived to be the least expensive to perform?

Methodology

During the late 1980s and early 1990s, the vocational education program area at The Ohio State University (OSU) underwent a significant downsizing of its academic offerings. The faculty utilized *Instructors Competencies: The Standards* (Hutchison, Shepherd, & Stein, 1988) and the *American Society for Training and Development (ASTD) Models for HRD Practices - Competencies* (McLagan, 1989) to create an undergraduate specialization in technical education and training. Faculty recognized the importance of job analysis but could not agree on the JA methods to be taught. As a result, six JA methods recognized to be the most widely used, were investigated to facilitate arriving at a consensus.

To facilitate this investigation, the University provided a seed grant to identify a practical, reliable, and cost effective JA method that could withstand the rigors of a legal challenge. Levine's (1983) research identified important characteristics/concerns of popular job analysis methods to include versatility, standardization, acceptability, amount of training required, employee sample size, reliability, validity, costs, outcome quality, and completion time.

A purposeful sample of 180 job analysis practitioners and authors were invited to participate in the survey to address the differences. OSU Vocational and Technical Education faculty members were not surveyed to minimize the potential of internal bias. A total of 140 respondents agreed to participate in the survey. Of the 140 survey instruments mailed, 65% were returned within 30 days. Follow-up telephone calls were made to non-respondents, but no additional responses were received. Of the 91 returns received, 64 were usable. Usable is defined as those responses where the respondents answered all questions relative to at least one JA method. The respondents evaluated the JA methods with which they were familiar (see Tables 1 and 2). Because no respondent answered all questions in the six parts of the survey, the usable instruments were divided into six sub-instruments totaling 115. A sub-instrument represents a complete set of answers for a given JA method. Tables 1 and 2 reflect the findings from the Sage & Rinando study (1992). These data were used to answer the research questions in this survey.

Findings

Six JA methods were evaluated by 91 respondents. Sixty-four percent of the respondents answered all questions for three or four JA methods. These respondents could be classified as authors and researchers. Ratings yielded information about the purposes for JAs that included job descriptions, job classifications, job design, employee qualifications, employee training, and quasi-legal and legal requirements for each of the six selected JA methods. Each sub-instrument was evaluated on a 5-point scale with five being the highest rating possible and one being the lowest. Table 1, "Comparison of Job Analysis Purpose", reflects the average scores for each purpose.

Table 1 Comparison of Job Analysis Purposes

JA Method → / Purposes ↓	Position Analysis Questionnaire (n = 21)	Critical Incident Technique (n = 19)	TI/Codap (n = 22)	atCodap (n = 11)	Functional Job Analysis (n = 28)	DACUM (n = 14)
Job Descriptions	2.76	2.95	4.00	4.09	3.93	1.64
Job Classifications	2.38	2.05	3.59	3.55	3.68	1.07
Job Design	2.24	2.47	3.91	3.91	3.64	1.00
Employee Qualifications	2.48	2.32	4.14	4.18	3.64	1.00
Employee Training	2.86	2.79	3.18	3.27	2.86	1.57
Quasi-Legal and Legal Requirements	2.05	1.79	4.27	4.36	2.61	1.00
AVERAGE RANK	2.46	2.45	3.76	3.81	3.40	1.18

The JA method that received the highest average score (4.09) for preparing job descriptions was atCODAP. Functional Job Analysis (3.68) was the method receiving the highest average score for accomplishing job classifications. Both TI/CODAP and atCODAP received the highest average score (3.91) for job design. AtCODAP was the JA method receiving the highest average score for Employee Qualifications (4.18), Employee Training (3.27, and Quasi-legal and legal requirements (4.36).

Functional Job Analysis received the highest average score (3.46) for Employee Performance Appraisals. The overall highest rankings were for TI/CODAP (3.76), atCODAP (3.81), and Functional Job Analysis (3.40). Practicality concerns for each method were also considered.

Table 2 reflects the average rank ratings for each JA method in terms of versatility, acceptability, amount of training required, employee sample size, reliability, validity, costs, completion time, and average rank or overall effectiveness for each JA method.

Table 2 Comparison of Job Analysis Concerns

JA Method → / Concerns ↓	Position Analysis Questionnaire (n = 21)	Critical Incident Technique (n = 19)	TI/Codap (n = 22)	atCodap (n = 11)	Functional Job Analysis (n = 28)	DACUM (n = 14)
Versatility (Adaptability)	4.14	4.00	4.22	4.18	3.86	2.64
Acceptability	3.38	2.71	3.39	3.45	3.00	0.14
Amount of Training Required	2.81	2.57	2.13	3.36	2.68	1.86
Employee Sample Size	2.90	2.65	2.48	3.82	2.68	1.29
Reliability	3.57	2.81	4.00	4.27	2.96	1.86
Validity	2.86	1.67	4.00	4.36	2.46	1.21
Costs	2.57	2.62	1.74	3.91	2.61	4.07
Completion Time	2.57	1.86	2.00	3.64	2.61	3.86
AVERAGE RANK	3.10	2.61	3.26	3.87	2.86	2.12

The JA method in our sample that received the highest average score for being the most versatile or adaptable to job changes was TI/CODAP (4.22). DACUM was the JA method receiving the highest average score for both Costs (4.07) and Completion Time (3.86). atCODAP received the highest average scores for Acceptability (3.45), Amount of Training Required (3.36), Employee Sample Size (3.82), Reliability (4.27), and Validity (4.36) making it the JA method of choice by most respondents. JA methods, PAQ, TI/CODAP, and atCODAP were rated the most effective with average rankings of 3.10, 3.26, and 3. 87 respectively. atCODAP (3.87) was ranked slightly higher than all other JA methods included in the study.

Conclusions

Q1. Which JA method studied is perceived to be the most effective for HRM/HRD personnel?

The results relating to purposes indicate that the atCODAP methodologies received the highest ratings. It is noted that a modified DACUM process was frequently used by each of the methodologies as a preliminary instrument development strategy. Thus, job-oriented methodologies were rated higher than job dimension strategies. The results of the concerns section again indicate that the CODAP JA methods were ranked highest. These results, however, can not be taken as the final word because of the number

of new JA methods which have emerged since these data were gathered Methods that ranked high in acceptability, validity, and reliability typically are more costly and require more time to complete. atCODAP ranked high in these areas and was perceived to be a complete research methodology by respondents.

Q2. Which JA method studied is most versatile or adaptable to job changes?

Four methods, PQA, CIT, TI/CODAP, and atCODAP ranked highest in their versatility. A high rating in versatility suggests that the instrument developed by these methods could be easily adapted to many uses.

Q3. Which JA method studied is perceived to be the least expensive to perform?

DACUM ranked highest in cost effectiveness. DACUM, however, reflects a lower cost because the client assumes a portion of the costs. It is noted that no validity or reliability measurements are accomplished by DACUM facilitators. atCODAP's time and costs are not assumed by the client to the same degree as DACUM, therefore, depending on what is needed by the organization, atCODAP may be able to satisfy the organization's needs, including reliability and validity measurements, at an overall cost equal to or lower than DACUM.

Implications for HRM/HRD Practitioners

The results of this study failed to generate explicit answers to the research questions. First, atCODAP's research method and practicality concerns allowed it to be selected as the JA method of choice to be taught in OSU's vocational education and HRD curricula. The decision was influenced by CODAP's high ratings from the studies performed which reflected completeness and legal defensibility,

Second, even with a large number of OSU's faculty being trained as DACUM facilitators, the faculty committee acknowledged the importance of teaching several research methods as part of the JA process. As a result, no single JA method was recommended to be introduced as part of the course curriculum.

Third, due to the improvements offered by atCODAP, a more cost and time effective process has been identified for employers to determine what employees are doing on the job. Survey findings can assist HRM/HRD personnel in selecting the JA method best suited for their needs.

Need for Future Research

1. There is a significant need to evaluate all available personal computer JA methodologies which generate JA instruments or record an incumbent's response.
2. Due to the number of truncated JA methods being introduced for computer platforms , the traditional JA methods and the truncated JA methods need to be evaluated together in a new study so that the new JA methodologies, emerging since the Sage & Rinando study (1991), are not excluded from evaluation.
3. A new study needs to be conducted to identify and evaluate the research methods used by each JA strategy both at OSU and other institutions.
4. Research is needed to establish a standard for how analysts determine the half-life of a job or occupation.

References

Fine, S.A. & Wiley, W.W. (1971). *An introduction to functional job analysis*. Kalamazoo, MI: Upjohn Institute for Employment Research.

Flanagan, J.C. (1954). The critical incident technique. *Psychological Bulletin*, 51, 327-358.

Ghorpade, J.V. (1988). *Job analysis: A handbook for the human resource director*, Englewood Cliffs,

NJ: Prentice Hall.

Hodgson, J.D. (1972). *Handbook for analyzing jobs*. U.S. Department of Labor, Manpower Administration: MDC.

Hutchison , C., Shepherd, J., & Stein, F. (1989). *Instructor competencies: The standards*. Chicago: International Board of Standards for Training, Performance, and Instruction (IBSTPI).

Levine, E. L. (1983). *Everything you always wanted to know about job analysis*. Tampa, FL: Mariner Publishing Co.

McLagan, P. (1988). *Models for hrd practices - competencies*. Alexandria, VA: ASTD.

Sage, J.E. & Rocco, T.S. (1995). A critical hrd issue: A legally defensible job analysis using atcodap. In E.F. Holton III (Ed), *Proceedings of the AHRD 1995 Conference* (pp. 14-5). St Louis, MO.

Sage, J.E. & Rinando (1992). A comparison of job analysis processes. Unpublished report. The Ohio State University.

A Survey About Training Needs Assessment Practices in Selected Organizations: Summary of Results

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Training needs assessment (TNA) is an essential starting point for any planned learning experience. Yet little is known about actual practice. This article summarizes results of a 1995 survey of ASTD members. Although limited by a low response rate of only 11.7% (41 surveys returned), the results indicated that respondents conduct TNA most often for technical, clerical and supervisory employees. Respondents used individual development plans, focus groups and interviews most often as TNA methods but felt that the DACUM method, interviews and individual development plans (in that order) were the most effective.

Training needs assessment (TNA) "is a tool for determining valid and useful problems which are philosophically as well as practically sound," writes Kaufman and English (1979, p. 31). Perhaps best understood as "the systematic study of a problem or innovation, incorporating data and opinions from varied sources, in order to make decisions or recommendations about what should happen next" (Rossett, 1987, p. 3), TNA is essential to success in today's cost-conscious, downsized and fast-paced business settings because "training needs identify what people must *learn* if they are to perform successfully" (Robinson & Robinson, 1995, p. 24). Without using TNA, training professionals may end up doing nothing more than providing courses, entertaining employees, making people feel good, and fixing isolated problems without any clear sense of how much or how well their efforts contribute to improving employee performance or humanizing the workplace (Cosgrove & Speed, 1995). Unfortunately, that may be exactly what is happening in too many cases (Cosgrove & Speed, 1995). Although much has been written about TNA (see Moseley & Heaney, 1994), too little is known about typical TNA practices in U. S. organizations today.

What is the status of TNA? To answer that general question--and continue the line of investigation begun with an earlier study on perceived performance problems, causes and solutions (Rothwell, 1996)--the author prepared and mailed a survey to 350 randomly-selected members of the American Society for Training and Development (ASTD) in May 1995. Although the response rate was disappointingly low--only 41 surveys were returned by September 1995, making the response rate a mere 11.7%--the results of this descriptive and exploratory do shed some light on current practices. They also raise additional, intriguing questions about TNA.

This paper summarizes the results of the study. In the sections that follow the author will describe the research questions guiding the study, the study methodology, key conclusions and issues for future investigation.

Research Questions

The major goal was to assess current TNA practices. More specific study goals focused around answering such questions as these:

1. What job categories are the most frequent targets of systematic TNA methods?
2. What TNA methods are most frequently used by selected HRD professionals who are ASTD members?
3. What TNA methods are perceived to be most effective by selected HRD professionals who are ASTD members?

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4. What did the survey respondents perceive to be the biggest problems or difficulties faced by organizations that conduct TNA?

5. What did the survey respondents perceive to be the biggest advantages that are gained by organizations that conduct TNA?

Methodology

The researcher began the study by drafting a survey to address the research questions listed above. The 4-page survey consisted of 10 items and numerous subitems. Questions 1-4 solicited background information about respondents and their organizations; Question 5 solicited information about the conditions leading to TNA in the organization; Question 6 solicited information about the frequency of TNA conducted for various job categories in the organization; Question 7 solicited information about how often respondents used various TNA methods and how effective respondents perceived them to be. Question 8 inquired about the biggest problems encountered by respondents in conducting TNA; Question 9 inquired about the biggest advantages resulting from TNA when conducted in the respondents' organizations. Finally, Question 10 asked respondents to make any additional comments about TNA they wished.

How Was The Survey Prepared? Two HRD professionals reviewed the survey prior to mailing. The researcher revised the survey based on their recommendations.

How Was The Survey Conducted? In May 1995 the researcher selected a random sample of 350 HRD professionals from the 1994 membership list of the American Society for Training and Development and mailed the questionnaire on May 5, 1995. Approximately 2 weeks after the survey was mailed, a follow-up postcard was sent to the original list of survey recipients to encourage a response. Names were selected from the alphabetic listing of ASTD members. Consultants and academicians were excluded when their names were drawn for the sample. No effort was made to follow-up with nonrespondents.

Limitations of The Survey. The survey results should be viewed cautiously for several reasons. This study was limited by (1) a low response rate, even for a survey of this kind; (2) possible systematic bias resulting from the use of a random sample of members of the American Society for Training and Development; and (3) no follow up with nonrespondents. Given the study's limitations, the results cannot be generalized beyond the respondent group.

Results and Conclusions

Although the response rate as 11.7%, not all respondents answered every question. Hence, responses vary by item. This section will report on the demographic information about the respondents and answer the major research questions posed by the study.

What Demographic Information Was Collected About the Respondents? Of the 33 respondents who indicated the industry in which their organization was classified, 10 (30%) represented manufacturing. Three respondents (9%) marked "transportation/communication/electric/gas," 1 (3%) marked "retail trade," 2 (6%) marked "finance, insurance, real estate," 5 (15%) marked "healthcare," 6 (18%) marked "government/armed forces," and 6 (18%) marked "other."

Of the 41 respondents who indicated the number of people employed by their organizations, 10(24%) indicated their organizations employed between 2000-4999 workers; 8(20%) marked 10000 and above, 8(20%) marked 500-1999, 7 (17%) marked 0-99, 4 (10%) marked 5000-9999, 3 (7%) marked 250-499, and 1 (2%) marked 100-249.

Of the 30 respondents who chose to indicate whether they have responsibility for supervising staff, 18 (60%) marked "yes" and 12 (40%) marked "no."

Question 1: What Job Categories Are the Most Frequent Targets of Systematic Training Needs Assessment Methods? Respondents were asked to indicate "how often your organization conducts training needs assessment for each job category." They were then presented with a list of possible job categories and frequencies. The survey results are presented in Table 1. The results show that respondents collectively are assessing the training needs of technical employees, clerical employees

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Table 1: Frequency of Training Needs Assessment by Job Category									
Job Category	**Frequency**								
	Never	Once every 6+ yrs.	Once every 4-6 yrs.	Once every 3-4 yrs.	Once every 2-3 yrs.	Once every 1-2 yrs.	Once every year	Mean	Stnd Dev.
Executives	29	2	3	1	2	7	10	3.11	2.57
Middle Managers	18	3	1	4	4	9	13	4.0	2.55
Professional employees	16	4	3	1	5	8	16	4.19	2.56
Technical employees	12	2	3	-0-	4	12	18	4.76	2.46
Supervisors	12	2	4	4	4	5	22	4.68	2.47
Salespersons	13	3	3	2	3	3	13	4.0	2.6
Clerical employees	19	4	2	1	5	7	12	3.76	2.58
Production employees	12	1	1	2	4	7	16	4.63	2.55

and supervisors more often than other groups.

Question 2: What TNA Methods Are Most Frequently Used By Selected HRD Professionals Who Are ASTD members? Respondents were supplied with a list of 11 possible TNA methods and were asked to indicate which ones they used most often. The survey results are presented in Table 2. They show that, according to respondents, they are most often using individual development plans, focus groups and interviews as TNA methods.

Question 3: What TNA Methods Are Perceived to be Most Effective By Selected HRD Professionals Who Are ASTD Members? Respondents were asked to rate the relative effectiveness of a list of 11 possible TNA methods. The survey results are presented in Table 3. They show that, according to respondents, they perceive the most effective approach to be the DACUM method. DACUM is, of course, an acronym formed from portions of the phrase **D**eveloping **a** **C**urriculum (Norton, 1985). Widely used in technical training and in community colleges, DACUM has also been the subject of innovation (Rothwell, 1995).

Question 4: What Do Respondents Perceive to be the Biggest Problems Organizations Face in Conducting TNA? Respondents were asked this question: "What are the biggest problems or difficulties that your organization has faced in conducting training needs assessment?" That question evoked 2 ½ pages of single-spaced responses. Content analysis revealed that the most common problems cited were lack of time, lack of staff and lack of expertise to conduct TNA. Sample verbatim responses are provided in Table 4.

Question 5: What Do Respondents Perceive to be the Biggest Advantages Gained by Organizations in Conducting TNA? Respondents were asked this question: "What are the biggest advantages your organization has gained by conducting training needs assessment?" That question evoked 2 pages of responses. Content analysis revealed that respondents most often cited such advantages as time-savings, cost-savings and proper identification of training requirements.

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Table 2: Perceived Frequency of Use of Training Needs Assessment Methods							
Needs Assessment Method	**Frequency of Use**						
	Not at all 1	Seldom 2	Some times 3	Frequently 4	Very Frequently 5	Mean	Standard Deviation
Assessment Centers	30	4	-0-	1	-0-	1.20	0.58
Competency Assessment	12	4	9	7	4	2.64	1.42
The DACUM method	22	-0-	1	1	1	1.36	1.04
Document Reviews	11	3	8	4	4	2.57	1.45
Exit Interviews	4	8	3	7	8	3.23	1.45
Focus Groups	6	4	4	17	5	3.31	1.33
Individual Tests/ Assessment Instruments	5	10	6	10	6	3.05	1.33
Individual Development Plans	6	5	8	9	11	3.36	1.42
Interviews	1	3	8	2	4	3.28	1.18
Observations	2	4	6	2	2	2.88	1.20
Written/ Phone Surveys	3	3	5	3	3	3.00	1.37

Issues for Future Investigation

Here are some recommendations for future research on training needs assessment in no particular order of implied importance:

- What are the perceived advantages and disadvantages of each TNA method for each job category?
- What affects how often TNA is carried out?
- What affects the effectiveness of TNA approaches and methods?
- What challenges face external consultants who conduct TNA that differ from those

Table 3: Perceived Effectiveness of Training Needs Assessment Methods							
Needs Assessment Method	**Effectiveness of Method**						
	Not at all Effec-tive 1	Not Very Effective 2	Some times Effec-tive 3	Effective 4	Very Effective 5	Mean	Standard Deviation
Assessment Centers	5	2	4	5	2	2.83	1.42
Competency Assessment	-0-	-0-	13	13	2	3.61	0.63
The DACUM method	-0-	-0-	1	2	2	4.20	0.84
Document Reviews	-0-	3	8	8	1	3.35	0.81
Exit Interviews	-0-	4	13	6	3	3.31	0.88
Focus Groups	-0-	2	10	16	4	3.69	0.78
Individual Tests/ Assessment Instruments	-0-	2	15	10	5	3.56	0.84
Individual Development Plans	-0-	4	5	16	6	3.77	0.92
Interviews	-0-	-0-	5	9	2	3.81	0.66
Observations	-0-	-0-	5	7	1	3.69	0.63
Written/ Phone Surveys	-0-	5	4	6	-0-	3.07	0.88
Other Effective Methods: "Liability suits, court decisions, and demand"							

faced by internal consultant/practitioners?

- How well integrated are TNA and training evaluation practices?
- What are the relative strengths and weaknesses of commercially-available TNA software?

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Table 4: The Biggest Problems in Conducting Training Needs Assessment

Note: Each bulleted item below is the verbatim response from one respondent.

- Being consistent in when & how
  Follow-up to make changes to training material
- Time factor = low return rate; knowing how to construct the assessment
- 1. Time or lack of it
  2. Perception of senior management that something is a training issue when it's really something else
- 1. Management willingness to deal with
  2. Not everyone returns surveys
  3. Not stuff or resources to purposely (?) analyze changing competencies skills for jobs changing so fast
- 1. Exit interviews = Ex-employees do not return
  2. Performance reviews = Training needs listed are too general
- 1. The diversity of the group makes identifying needs difficult
  2. Supervisors not really knowing what the employees' training needs are
- 1. Manpower to conduct needs assessment
  2. Time it takes to analyze macro needs analysis
  3. Staying focused on results, not on efforts
- 1. Getting associates to identify training needs
  2. Getting management & nonmanagement associates to respond
- 1. Compiling data in a user friendly format
  2. Identifying tools that focus on retraining
  3. Analyzing data quickly and efficiently
- 1. Identify best method to conduct TNA
  2. Design/identify instrument to conduct TNA
- 1. No one in our organization knows what instrument to use when & how
- 1. Perception by management
  2. Lack of time
  3. No commitment from upper management

Conclusion

Interest in TNA appears to be growing as HRD professionals find themselves faced with diminishing resources, increasing demands on their time and heightened accountability. Although this paper describes the results of a limited study, more intensive research should be directed to identifying and examining typical as well as best-in-class TNA practices. Without information about "what is really going on," it is difficult for academicians to develop worthwhile research agenda in the field.

References

Cosgrove, G., & Speed, R. What's wrong with corporate training. *Training* (January 1995), p. 53.

Kaufman, R., & English, F. (1979). *Needs assessment: Concept and application*. Englewood Cliffs, NJ: Educational Technology Publications.

Moseley, J.L., & Heaney, M.J. Needs assessment across disciplines. *Performance Improvement Quarterly, 7*(1), 60-79.

Norton, R. (1985). *The DACUM handbook*. Columbus, OH: National Center for Research in Vocational Education.

Robinson, D.G., & Robinson, J.C. (1995). *Performance consulting: Moving beyond training*. San Francisco: Berrett-Koehler, 1995.

Rossett, A. (1987). *Training needs assessment*. Englewood Cliffs, NJ: Educational Technology Publications.

Rothwell, W.J. (1995). Assessing the training needs of supervisors-turned-team-leaders. In J. Phillips and E. Holton III (Eds.), *In action: Conducting needs assessment* (pp. 227-240). Alexandria, VA: The American Society for Training and Development.

Rothwell, W. J. (1996). *Beyond training and development: State-of-the-art strategies for enhancing human performance*. New York: AMACOM.

Table 5: The Biggest Advantages to Conducting Training Needs Assessment

Note: Each bulleted item below is the verbatim response from one respondent.

- 1. Avoided expenditures for unnecessary training
  2. Identified "hidden" talents/desires
  3. Made people feel company was committed to their growth/development
- 1. Less resources placed inaccurately
  2. Peer review on competencies
  3. Listening to internal customer needs through focus groups
- 1. Selecting the correct intervention
- 1. Identifies where the problem exists
- 1. Focus--Employees know what current job competencies are
  2. Specificity--Testing is more specific than general
  3. Unity--Processes (i.e., assessment, development, successes) planning all on same system
- Awareness--Give employees needed information
- 1. Better training
  2. More support for training
- 1. Customers get what they needed
  2. Clear return-on-investment shown
- 1. Satisfied critical training requirements
  2. Well-trained work force
- 1. Structuring recommended curriculum
  2. Identifying field training needs
  3. Tracking training to business results
- 1. Clear job definition
  2. Targeted, appropriate training
- 1. Tailor training sessions, to get the most impact
  2. Isolate areas that require retraining
  3. Create confidence in attendees, regarding material covered, its what they requested and not "useless" information for them
- 1. The ability to plan for needed effort provides focus
  2. Helps in budget preparation and justification
- 1. Focus groups of what employees say they need but aren't getting the proper training in.
  2. Advantage: The training department will know what areas employees need training in (based on gap feedback as 1 criteria).
  3. After assessing needs, training can be conducted as soon as possible in order for the trainer to fill in performance gaps within their time frame(s).

Strategic Quality Training: A Comprehensive Training Process To Ensure Transfer of Learning

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Currently, Human Resource Development divisions are challenged to identify the return on corporate training investments. Utilizing the Strategic Quality Training model, the Connecticut Department of Labor a realized a minimum of 81% long term transfer of training for a technical skills training program. In addition, this training process supports the integration of training as a strategic business tool by: (a) involving all stakeholders in the training process, (b) reinforcing workplace application of training, and (c) evaluating the impact of training interventions.

To survive in the competitive economy of the 1990s, government agencies are making fundamental changes in business practice. These organizations are adopting new strategies for service delivery and new approaches for the management of technology (Dertouzos, Lester, & Solow, 1989; Hastings, 1995). Legislative mandates are forcing agencies to develop strategies to provide high quality service that meets or exceeds customer expectations. To support the new strategies, agencies are also redesigning work structures. Flat, flexible organizational designs are replacing the traditional hierarchies to encourage participative decision making that fosters the development of capable, committed workers (McLagan, 1989).

To support these changes competitive agencies are expanding the organizational role of Human Resource Development (HRD) divisions (e.g., Staff Development and Training) (Dertouzos, Lester, & Solow, 1989; Hastings, 1994). In fact, these divisions are shifting from reliance on an organizational role emphasizing the design and delivery of training to reliance on an organizational role emphasizing the creation of learning systems within the organization (Hastings, 1995; Senge, 1990). In this context, training is considered a tool that promotes organizational improvement.

Training that ensures state agencies' abilities to flexibly react to dramatic, rapid, multifaceted change requires transfer of training or the application of training skills in the workplace (Baldwin & Ford, 1988). Business success, therefore, depends on timely training that is incorporated in job tasks. Training must be provided to: (a) respond to customer needs, (b) support each agency's strategic mission, (c) develop skills of workers in all levels of the organization, (d) promote continuous improvement in the workplace, and (e) provide a significant return on investment (Hastings, 1995).

Accomplishing these objectives is a challenge for most state agencies. Recent survey data gathered by the Employment Service Capacity Building Project (1995) suggest that most agencies do not use training as a strategic business tool. In fact, the data suggest that training is an underutilized resource because training: (a) is generally offered as an isolated event, (b) is not always preceded by a needs assessment, (c) is not always designed to correct specific skill deficits, (d) does not routinely evaluate participants' learning or organizational improvement, (e) is not always delivered by professional trainers and (f) is not always related to customer needs. Thus, state agencies seeking to remain competitive face a common problem: How to implement a comprehensive training process that promotes the workplace application of training skills in support of the agency's mission and goals.

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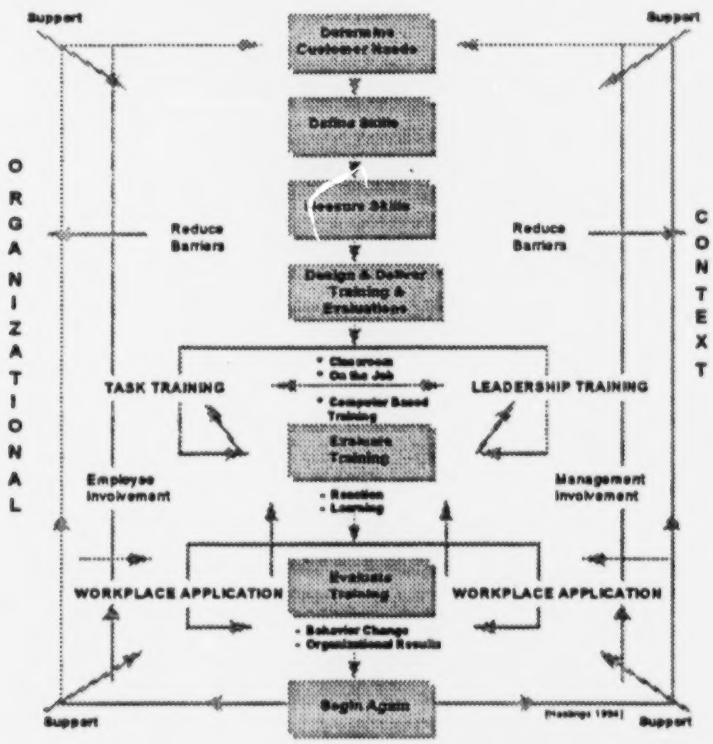
Transfer of Training

Transfer of training researchers (Baldwin & Ford, 1988; Laker, 1990; Porter & Lawler, 1990) have identified three factors that significantly enhance the probability of transfer of training. These interdependent factors are: instructional content that provided the skills and knowledge to do a job, motivation to use the skills and knowledge learned in the classroom, and a work environment that supports the use of the newly acquired skills and knowledge. To illustrate the interaction of these factors researchers (Broad and Newstrom, 1992; Huczynski & Lewis, 1980) propose that training has three distinct phases: (1) the pre-training phase characterized by the identification of the training need and the initiation of the motivation to engage in the learning process, (2) the learning phase characterized by the delivery of materials to give participants skills so they can improve job performance, and (3) the post-training phase characterized by the management of the work environment to promote transfer of knowledge, skills, and abilities learned in the classroom to work settings.

To incorporate training strategies for the three phases of training, other researchers (Broad & Newstrom, 1992, Goff, Hastings, & Sheckley, 1992) suggest that organizations form transfer partnerships that include three key stakeholders: the trainee, the trainer, and the manager. Together, these partners, work to support the long term workplace application of knowledge, skills, and abilities learned in a classroom. In this paradigm, on-the-job application of training is the major determinant of successful training. Training outcomes are measured with concrete examples of the integration of training concepts in daily work activities over time (Brinkerhoff & Gill, 1992). Additional research conducted at the Connecticut Department of Labor in 1994, determined that organizational constraints (e.g., differences in managers' behaviors, differences in managers' goals), work group constraints (e.g., differences in commitment of work groups, differences in goals of work groups), and individual constraints (e.g., age differences, differences in performance anxiety) must also be managed to attain consistent use of training skills in the work environment (Hastings, 1994).

Strategic Quality Training

Strategic Quality Training (Figure 1)



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In Step One of the Strategic Quality Training process, customer requirements are aligned with the agency's strategic mission to ensure the delivery of training that enhances the staff's capacity to deliver products and services customers want. In Step Two, the skills needed to provide missing or inadequate service are defined. Step Three includes the assessment of each employee's ability to perform required job tasks, the establishment of performance standards, and the design of a training plan to close the skill gap. To complete Step Four, HRD staff work with participants and their supervisors to design curriculum and evaluations as well as deliver the training. Two kinds of training are designed: (1) "task training" or training to transmit skills participants need to perform job tasks and (2) "leadership training" or training participants' supervisors need to learn how to support the workplace application of participants' new skills. Additionally, evaluations to determine participants' reactions to the training, participants' learning and participants' long term use of the training skills are designed. Once the training has been delivered the transfer of training is assessed in Step Five with the administration of evaluations immediately following the training and three to six months after the training has been completed. Finally, the data gathered in Step Five is used as baseline data for the next round of training. Modification of the training design and new training goals are the end results of the Strategic Quality Training process. In this final step continuous improvement begins with a re-examination of the customers' needs.

Methods and Procedures

Hastings used the Strategic Quality Training model to design training for 44 support staff workers at the Connecticut Department of Labor to improve the support services they delivered to field office workers. Specifically, the training was designed to cross-train workers previously providing one of three services (claims exam services, merit rating services, or benefit payment control services) to enable them to provide all three services. The three phase pay for skills cross-training program incorporated training to standardize procedures and evaluations to test employees' abilities to perform the new job tasks.

The training was developed to: (a) include all stakeholders in the design and delivery of the training and evaluations, (b) design the training to support the strategic mission of the agency, (c) use a Labor Management Committee to determine policy for training interventions, (d) combine classroom training and on-the-job training (e.g. task training for job incumbents), (e) build peer coaching and support into the training process, (f) use supervisors to train and evaluate performance, (g) teach supervisors how to coach and mentor employees (e.g., leadership training), (h) use evaluations immediately following the training, three months later, and six months later to assess employees' performance, (i) link training with job performance, and (j) use the training and the evaluations to pay employees for demonstrated ability to perform the new jobs (training used as a vehicle for promotion).

Evaluations were administered immediately following the training to determine participants' reaction to the training and to measure learning. Additional evaluations were administered three and six months after the training had been completed to determine long term application of training skills. All participants completed (a) a course evaluation, (b) a short answer question/simulated work exercise evaluation, and (c) two work sample evaluations.

The training and evaluation process (figure 2) was designed to check performance and provide improvement strategies at several points. To successfully complete each phase of the formal training, participants demonstrated the ability to use the training to complete short answer questions and job simulation exercises. Since workplace application of skills was expected, a rotation schedule to ensure the practice of training skills was implemented. In fact, supervisors reviewed work and assessed participants' abilities to meet performance standards using standardized evaluation forms at three and six month intervals after the training was completed.

The Training Process for Central Office Support Staff

Step One	Provide training
Step Two	Evaluate knowledge, skills, and abilities immediately following training
Step Three	(A) Provide time for workplace application of skills and development of individual development plans for areas of weak performance (B) Provide remediation
Step Four	Re-evaluate knowledge, skills and abilities
Step Five	Provide time for workplace application of training skills
Step Six	Evaluate workplace application of skills three months after training
Step Seven	Revise Individual Development Plans
Step Eight	Provide time for workplace application of skills
Step Nine	Re-evaluate the workplace application of skills to determine readiness for promotion
Step Ten	(A) Refine Individual Development Plans and continue to coach weak performers (B) Continue to monitor the performance of good performers
Step Eleven	Use performance standards to determine ratings for annual appraisals

Figure 2

Results

While the long term training goal was to provide improved customer service for the field staff, the immediate training goal was to provide a training process that ensured the workplace application of new skills. Consequently, Connecticut Department of Labor measured participants' reactions to the training and evaluation process, and participants' learning immediately following the training and at three month and six month intervals after the training had been completed.

Participants' Reactions. Immediately following each training session participants were asked to complete an evaluation of the training session. Overall, data collected determined that the trainees were pleased with the training as well as the abilities of each of the three training supervisors. For example, 92% of the participants stated that the training encouraged active participation. Ninety-six percent also stated that the trainer frequently or nearly always provided useful feedback and frequently or nearly always provided reinforcement and praise. In addition, trainers promoted learning by encouraging the sharing of ideas/information (89% strongly or completely agree), removing learning obstacles (86% strongly or completely agree), and modeling appropriate customer service behaviors (81% strongly or completely agree). Finally, participants believed that the evaluations were fair (97% agree), that the evaluation exercises matched the course content (97% agree), and that the evaluation would be graded fairly (98% agree).

Participants' Learning. As depicted in Table 1, 43 participants successfully completed evaluations for Claims Exam work, 41 participants successfully completed evaluations for Merit Rating work, and 42 participants successfully completed evaluations for Benefit Payment Control work. The six individuals who did not successfully complete the evaluations received additional training and then completed remediation evaluations. All of the six passed the remediation evaluations for a 100% success rate.

Evaluation of the Participants' Learning
(immediately following the training)

	1995 Central Office Staff N=44		
	Claims Exam	Merit Rating	BPCU*
% of Staff successfully completing the *initial* evaluations	97.7% (43 people)	93% (41 people)	93% (42 people)
% of Staff successfully completing the *remediation* evaluations	2.3% (1 person)	7% (3 people)	4.5% (2 people)
Totals	**100 % (44 people out of 44)**	**100 % (44 people) out of 44**	**100 % (44 people) out of 44**

* BPCU- Benefit Payment Control Unit

Table 1

Participants' Behavior Change. Successful completion of the initial evaluations, however, did not guarantee successful workplace application of skills. In fact, evaluations administered three months after the training recorded mixed results (NOTE: Only 26 training participants were required to take this evaluation because these 26 participants were the only trainees participating in the new work processes due to a reassignment of staff after the initial training was completed). As outlined in Table 2, participants were most successful in meeting performance standards for the Claims Exam tasks (24 individuals or 92%), Participants' demonstrated more difficulty, however, in meeting performance standards for BPCU tasks (18 people or 69% were successful) and Merit Rating tasks (11 individuals or 42% were successful).

Evaluation of the Change in Participants' Behavior
(three and six months after the training)

	1995 Central Office Support Staff N=26		
	Claims Exam	Merit Rating	BPCU
% of Staff successfully completing the follow-up assessment of work performance after *three* months	92% (24 people)	42% (11 people)	69% (18 people)
% of Staff successfully completing the follow-up assessment of work performance after *six* months	100% (26 people)	81% (21 people)	96% (25 people)
Totals	**100% (26 people)**	**81% (21 people)**	**96% (25 people)**

Table 2

Individual Development plans to promote continuous skill improvement were created to provide on-the-job training for employees unable to meet the performance standards. Supervisors mentored trainees and provided additional opportunities to practice training skills. In addition, focus groups of

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individuals unable to meet performance standards were held for the Merit Rating work and the BPCU work to identify best support strategies. Based on the focus group data, desk aids were revised to include more detail of the job tasks and the rotation schedule was changed to give participants longer rotations in the Merit Rating unit and the BPCU unit. The Merit Rating supervisor also conducted on-the-job training sessions to explain errors each day. Peer mentoring was also encouraged as an informal training strategy, especially in the Merit Rating unit.

Progress was formally assessed again six months after the training. At six months many more participants were successfully using the training skills to complete their daily work. In fact, all 26 participants (100%) were able to meet the performance standards for the Claims Exam tasks while 21 participants (81%) were able to meet the performance standards for the Merit Rating tasks and 25 participants (96%) were able to meet the performance standards for the BPCU tasks.

Additional Measures. To further the define the success of the training initiative, The Connecticut Department of Labor has determined that the training was successful based on its ability to successfully implement the Strategic Quality Training process to attain long term transfer of training. The following ten specific objectives were met:

1. Inclusion of all stakeholders in the design and delivery of the training and evaluations.
2. Combination of classroom and on-the-job training.
3. Utilization of supervisors for training and evaluating performance.
4. Inclusion of peer coaching and support in the training process.
5. Design of training to support the agency's strategic mission.
6. Administration of evaluations..
7. Utilization of training and evaluations to determine promotions..
8. Utilization of a Labor Management Committee..
9. Development of coaching/mentoring skills for supervisors..
10. Linkage of training and job performance.

Conclusions

This study demonstrates that careful, detailed planning of a training initiative can result in long-term transfer of training. Successful results, however, are not easily attained. In fact, several lessons can be learned from this study:

1. ***Transfer of Learning Requires Commitment from all Levels of the Organization.*** Transfer of learning can not be attained without commitment from all levels of the organization. Executives, managers, supervisors, and trainees must all be committed to the process. Because transfer requires a tremendous effort from many people, it's especially critical that managers and executives "walk the talk". In this case, Alice Carrier's (Director of Operational Support) consistent, visible commitment to the training initiative kept her subordinates engaged even when they complained that the process was "just too hard". In addition, Carrier attended meetings and focus group sessions to publicly model her commitment and gain support for the initiative at critical junctures in the process.
2. ***Staff Development Must Offer Performance Consulting Services.*** The traditional human resource development role must be expanded in organizations that are committed to developing staff. For this initiative, Staff Development personnel provided performance consulting services to guide the process. Not only did Staff Development personnel design and deliver the training and evaluations, but they also facilitated the three part training process. Staff Development monitored the process and used data to determine corrective strategies. In addition, Staff Development coached the supervisors, mentored the managers, and reported progress to executives and labor union representatives. This training initiative was successful, in part, because Staff Development orchestrated the entire process.
3. ***Resistance Should Be Expected.*** Change is always a threat to some individuals. Therefore, any cross-training initiative will be resisted by some employees in all levels of the organization. Connecticut Department of Labor managed the resistance by: (a) involving all stakeholders in the process, (b) conducting several group meetings to encourage participants' to share concerns, and (c) implementing changes in all steps of the process based on recommendations of participants. At all

times, supervisors, managers, and Staff Development personnel stressed that the training initiative was evolving and would be revised when necessary.

4. ***Communication Will Make or Break a Training Initiative.*** To successfully implement a cross-training initiative requires a commitment to good communication. During this training initiative Staff Development and the Director of Operational Support frequently communicated the vision and the steps needed to achieve success. Written memos, informal discussions, focus group discussions, and staff meetings were all used as communication tools.
5. ***Staff Will React Negatively to Evaluations.*** This training initiative utilized evaluations to assess participants' ability to perform new job duties. In addition, successful completion of the evaluations resulted in a promotion to a higher job classification. Consequently, participants reported anxiety about their abilities to pass the evaluations and wondered if the evaluations would be used to punish non-performers. Again, Staff Development, the Director of Operational Support, and the supervisors of the three units continually reminded staff that the goal of the training was to help staff successfully demonstrate their abilities to meet the performance standards. Over time visible management support (e.g., Individual Development Plans, feedback) reduced participants' apprehension. Based on supervisors' behaviors, participants learned to believe that the training goal was to help all participants succeed in the higher job classification.
6. ***Cross-Training Staff is a Challenge.*** This training initiative was designed to teach individuals how to integrate three distinct jobs. Connecticut DOL underestimated how long it would take to cross-train staff and underestimated how difficult it is to learn how to provide integrated services in a three month time period. Future cross-training will be designed to offer additional workplace support and will allow more time for participants to practice the new skills.

References

Baldwin, T. T., and Ford, K. J. (1988). Transfer of training: A review and future directions for research. Personnel Psychology, 41, 63-105.

Broad, M. L., and Newstrom, J. W. (1992). Transfer of training. Reading, Massachusetts: Addison-Wesley Publishing Company, Inc.

Dertouzos, M.L. Lester, R.K., and Solow, R. M. (1989). Made in America: Regaining the competitive edge. New York: Harper Collins Publishers.

Ford, J. K. (1994). Defining transfer: The meaning is in the answers. Adult Learning, 5(4), 23-30.

Goff, B. A., Hastings, S. L., and Sheckley, B. G. (1992, Spring). Deschooling corporate training. Paper presented at the New England Psychological Association Conference, Boston, MA.

Hastings, S. L. (1994). Transfer of training: The impact of supervisory support, supervisory involvement, situational constraints, and self-efficacy on the application of technical skills training. Dissertation, June 1994.

Hastings, S. L. (1995). Strategic quality training: The transformation of the Connecticut Department of Labor in Elwood F. Holton, III (Ed.), 1995 Proceedings of Academy of Resource Development Conference (12-4). Minneapolis, MN: Academy of Human Resource Development.

Hastings, S. L. (1995).. Transfer of training: The impact of supervisory support, supervisory involvement, situational constraints, and self-effficacy on the application of technical skills training in Elwood F. Holton, III (Ed.), 1995 Proceedings of Academy of Resource Development Conference (20-2). Minneapolis, MN: Academy of Human Resource Development.

Hastings, S. L. (1995). Training: Six steps for capacity building. Workforce Journal, 5(4).

Huczynski, A. A., and Lewis, J. W. (1980). An empirical study into the learning process in management training. Journal of Management Studies, 17(2), 227-240.

Laker, D. R. (1990). Dual dimensionality of training transfer. Human Resource Development Quarterly, Fall, 209-223.

McLagan, P. A. (1989). Models of HRD Practice. Training and Development Journal. September, 1-9.

Senge, P. M. (1990). The fifth discipline: The art and practice of the learning organization. New York: Doubleday.

Silberman, M. (1990). Active Training. New York: Lexington Books.

West, M. A. (1990). The social psychology of innovation in groups. In West, M.A. & Farr, J.L. (Eds.), Innovation and Creativity at Work: Psychology and organizational strategies (pp. 176-201). New York: John Wiley & Sons.